

REMARKS

This Amendment is filed in response to the Office Action dated June 30, 2006, which has a shortened statutory period set to expire September 30, 2006.

Allowable Subject Matter

Applicant greatly appreciates the Examiner's indication of allowable subject matter. Specifically, Claims 3, 4, 9, and 10 are objected to as being dependent on a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. However, Applicant believes that Claims 1 and 7, i.e. the base claims for Claims 3, 4, 9, and 10, are patentable over Tanaka. Therefore, Applicant respectfully declines to amend Claims 3, 4, 9, and 10.

Claims 1, 2, 5-8, 11-36 Are Patentable Over Tanaka

Claim 1 recites in part,

measuring an aerial image gradient at the evaluation point of the two-dimensional segment.

Applicant respectfully submits that Tanaka fails to disclose or suggest this limitation. The First Office Action cites paragraphs [0055-0057] as teaching this limitation. Applicant traverses this characterization. These paragraphs teach using an imaging expression obtained by an eigenvalue expansion, for example in accordance with an optimal coherence approximation (OCA) method. This imaging expression, which serves as a rough model used in a rough correction, can find the image intensity distribution on a wafer.

Notably, this image intensity distribution does not teach Applicant's aerial image gradient. As taught by Applicant in the Specification, paragraphs [0040-0042],

In accordance with one aspect of the invention, an aerial image gradient can be used to accurately determine the entire influence on a corner. Specifically, all adjacent features to a corner, within a Gaussian-type distribution, can have some influence on the imaging of the corner. The aerial image of a feature can show the intensity of light versus position as a result of the lithographic process. Thus, the aerial image contains spatial information about the adjacent features, i.e. the local pattern, as well as the interaction of the local pattern with the lithographic process.

The aerial image gradient includes both the magnitude and the direction of the slope of the aerial image at its edge. In other words, the gradient is the directional rate of change. For example, for a point on a line end, the aerial image gradient can indicate how fast the intensity of light is changing (one-dimensional (1D) information) and in what direction (two-dimensional (2D) information). A useful analogy to the aerial image gradient would be skiing downhill using a minimal energy path (i.e. the fastest direction the person can ski).

This aerial image gradient can be used to predict an "attainable" shape, i.e. the realistic curvature, for the corner. The attainable shape can then be used to modify the mask layout feature based on realistic process capabilities. In one embodiment, this modification can be based on a dissection of edges of the feature, which can form part of an optimized OPC recipe.

Because Applicant's aerial image gradient is clearly distinguished from the imaging expression of Tanaka, Applicant respectfully requests reconsideration and withdrawal of the rejection of Claim 1.

Claims 2, 5, and 6 depend from Claim 1 and therefore are patentable for at least the reasons presented for Claim 1. Based on those reasons, Applicant requests reconsideration and withdrawal of the rejection of Claims 2, 5, and 6.

Claim 7 recites in part,

using an aerial image to determine an influence on that two-dimensional segment.

Applicant respectfully submits that Tanaka fails to disclose or suggest this limitation. The First Office Action cites paragraphs [0055-0057] as teaching this limitation. Therefore, Claim 7 is patentable for substantially the same reasons presented for Claim 1. Based on those reasons, Applicant requests reconsideration and withdrawal of the rejection of Claim 7.

Claims 8 and 11-12 depend from Claim 7 and therefore are patentable for at least the reasons presented for Claim 7. Based on those reasons, Applicant requests reconsideration and withdrawal of the rejection of Claims 8 and 11-12.

Claim 13, as amended, recites in part,

performing interpretation filtering to generate an interpreted pattern for at least one feature, the interpretation filtering including computing an aerial image gradient.

Applicant respectfully submits that Tanaka fails to disclose or suggest this limitation. The First Office Action cites step S114 of FIG. 5 as teaching this limitation. Applicant traverses this characterization. Step S114 merely performs an image intensity simulation at each evaluation point. Notably, an image intensity simulation does not teach Applicant's interpretation filtering that includes computing an aerial image gradient. See, e.g. the Specification, paragraphs [0040-0042] (provided above for convenience).

Because Applicant's interpretation filtering that includes computing an aerial image gradient is clearly distinguished from

the image intensity simulation of Tanaka, Applicant respectfully requests reconsideration and withdrawal of the rejection of Claim 13.

Claims 14-26 depend from Claim 13 and therefore are patentable for at least the reasons presented for Claim 13. Based on those reasons, Applicant requests reconsideration and withdrawal of the rejection of Claims 14-26.

Claim 27, as amended, recites in part,

instructions for performing interpretation filtering, the interpretation filtering generating an interpreted pattern for at least one feature, the interpretation filtering including computing an aerial image gradient.

Therefore, Claim 27 is patentable for substantially the same reasons presented for Claim 13. Based on those reasons, Applicant requests reconsideration and withdrawal of the rejection of Claim 27.

Claims 28-34 depend from Claim 27 and therefore are patentable for at least the reasons presented for Claim 27. Based on those reasons, Applicant requests reconsideration and withdrawal of the rejection of Claims 28-34.

Claim 35 recites in part,

measuring an aerial image gradient at the evaluation point of the two-dimensional segment.

Therefore, Claim 35 is patentable for the same reasons presented for Claim 1. Based on those reasons, Applicant requests reconsideration and withdrawal of the rejection of Claim 35.

Claim 36 depends from Claim 35 and therefore is patentable for at least the reasons presented for Claim 35. Based on those reasons, Applicant requests reconsideration and withdrawal of the rejection of Claim 36.

Claims 27-34 Are Directed To Statutory Subject Matter

Claim 27, as amended, recites, "A computer-implemented program for performing optical proximity correction on a mask layout, the computer-implemented program being stored on a computer-readable medium". Based on this amendment, Applicant submits that Claim 27 and its dependent claims, i.e. Claims 28-34, are directed to statutory subject matter. Therefore, Applicant requests reconsideration and withdrawal of the rejection of Claims 27-34.

CONCLUSION

Claims 1-36 are pending in the present application.
Allowance of these claims is respectfully requested.

If there are any questions, please telephone the
undersigned at 408-451-5907 to expedite prosecution of this
case.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Jeanette S. Harms', with a long horizontal stroke extending to the left.

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